USER'S MANUAL
TP1043 series

Via Enrico Fermi, 57/59 - 10091 ALPIGNANO (TO)
☎ Telefono: +39 (0)11 9664616 Fax: +39 (0)11 9664610
E-mail: srlmect@mect.it - C.F. e P.I. 04056380019

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1. Introduction

To grant a fast setup of the device please follow carefully the information in this manual.

1.1. Staff skill

Products described in this manual are devoted to PLC programmers or automation experts only. MECT S.r.l. declines any responsibility about malfunctioning or damage caused by incorrect use of MECT devices, due to noncompliance to this manual information. MECT S.r.l has an help desk.

1.2. Simbols

Danger
Follow this advice to avoid people injury.

Warning
Follow this advice to protect the device.

Caution
Follow this advice to have a more effective performance.

ESD (Electrostatic discharge)
Danger: possibly damage due to Electrostatic discharge.

Note
Step to follow for a correct installation.

Additional information

1.3. Terms

PLC:	TP1043
Terminals:	TPLC005, MPNC010, MPNC020, MPNC030
System:	PLC (TP1043) with terminals

1.4. Security

Attention
Switch off devices before connecting them.

ESD (Electrostatic discharge)
Modules have electronic components that can be damaged by. electrostatic discharge. Be sure to be connected to ground when handle the devices.

The instrument has no power switch and no internal fuse, but it powers on immediately after connecting a correct power supply input (check the power supply value on the instrument label). Keep the power supply line as short as possible and keep it separate from other power lines.
For security reasons it is necessary to have a 2 section power switch with a fuse near the instrument and easily replaceable.
Avoid the presence of other power actuators in the same control panel, high humidity, excessive heat and corrosive gas.
Instruments must have a power supply from security transformers or SELV transformers.

1.5. REFERENCE MANUAL

Quick Start
Qt Mect Configurator

2. System description

TP1043 is a device composed by a PLC and a HMI with touch-screen monitor 4.3” width and 480 x 272 pixel resolution with 262.000 colors.
TP1043 allows the supervision of networked devices Modbus RTU and Modbus TCP. The networks are managed simultaneously by TP1043 and data from a network can be sent on another thus creating a bridge between the two networks.

On TP1043 is present Micro-USB host port, that allows, with an adapter, the use of an USB-pen drive for software updates and data log.
On TP1043 are up to 1 Kbyte of retentive variables stored on flash.
The device is also able to manage an up to 8GB wide, micro SD card. The SD card is factory mounted on request.
A real-time clock buffered RAM maintains the date and time up to four months with the device turned off.
TP1043 is equipped with a micro PLC to make a small automation of the process.

The device can be applied in horizontal or in vertical design with the option "V" (see following pictures).

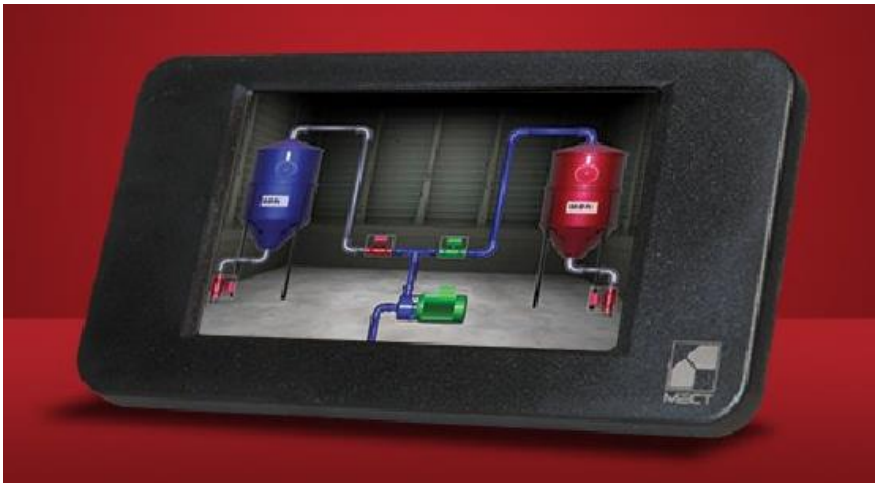

Figure 1: Front view TP1007 (horizontal version)

Figure 2: Front view TP1007 (vertical version)

2.1. Specification

TP1043 is based on a multiprocessor system. PLC and HMI are based on a 454MHz ARM9.

Table 1

PLC Hardware characteristics	
PLC Processor	ARM926JE 454MHz
RAM	128MB
FLASH	128MB
Non volatile variables	On FLASH memory
Real Time Clock	Yes with rechargeable battery
Screen	TFT 480 x 272 pixel 262k colors
Touch screen	Resistive 4 wires
Ethernet	10Mbit/s - 100Mbit/s self recognition
Micro-USB	Host 2.0
Micro SD	Max 8GB
PLC software characteristics	
OS	LINUX 2.35
PLC	IEC61131-3
Graphics	Based on QT library
CAN	CanOpen 2.0
ModBus	Modbus RTU master
Storage memory	Possibility of history storage
Field bus main features	
RTU Modbus	Master 2 wires
TCP Modbus	Client

3. Hardware Installation

In the following figures see the TP1043 dimensions.

3.1. Mechanical dimensions

Side view

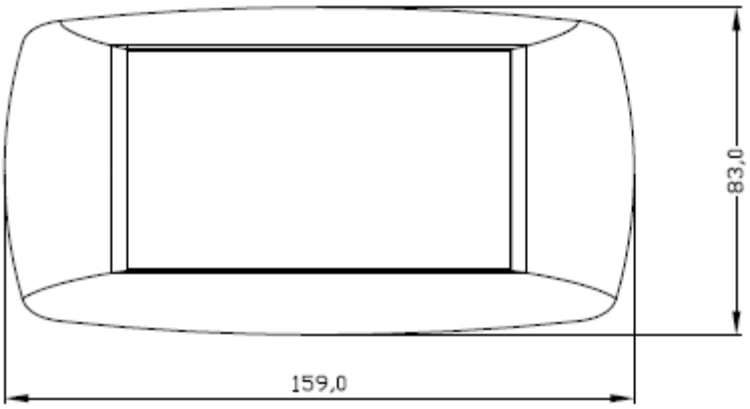

Figure 3

Rear view

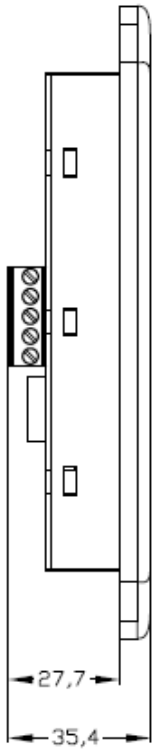

Figure 4

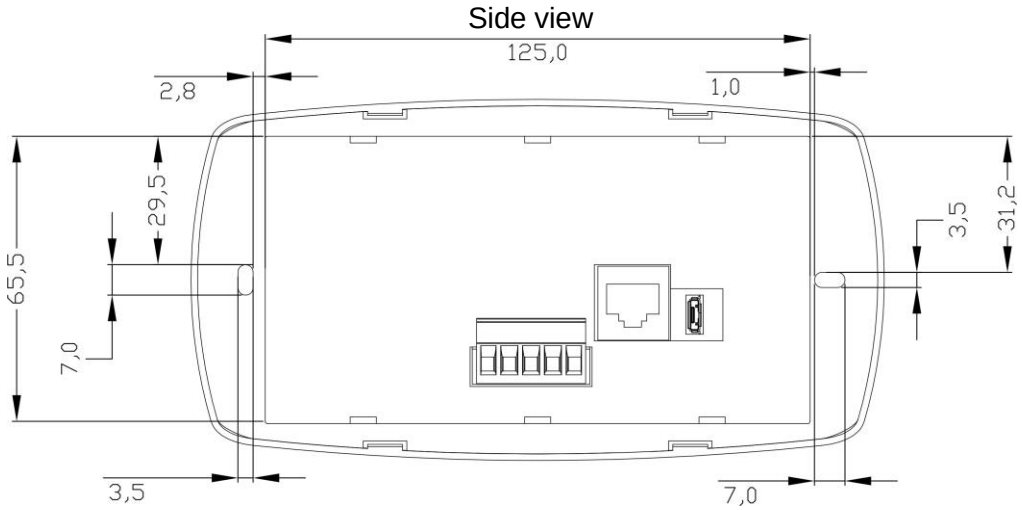

Figure 5

Technical specification

Table 2

Mechanical				
Material	ABS, Polycarbonate			
Dimensions W x L x H	27.7 mm x 159 mm x 83 mm			
Mounting plate	127mm x 68mm			
Installation	Panel installation			
Environmental conditions				
Operative temperature	0 °C ... 55 °C			
Storage Temperature	-20 °C ... +85 °C			
Relative Humidity	5 % a 95 % no condensation			
Electric isolation				
Air clearance	According to IEC 60664-1			
Pollution According to IEC 61131-2	2			
Protection				
Rear protection	IP 20			
Front protection	IP65			
EMC				
EMC according to EN 61000-6-2 (2001)				
Test specification	**Values**		**Class**	**Criterion**
EN 61000-4-2 ESD	4 kV/8 kV (contact/air)		2/3	B
EN 61000-4-3 electromagnetic fields	10 V/m 80 MHz ... 1 GHz		3	A
EN 61000-4-4 burst	1 kV/2 kV (data/supply)		2/3	B
EN 61000-4-5 surge	Data:	-/- (line/line)		B
		1 kV (line/earth)	2	
	DC supply:	0.5 kV (line/line)	1	B
		0.5 kV (line/earth)	1	
	AC supply:	1 kV (line/line)	2	B
		2 kV (line/earth)	3	
EN 61000-4-6 RF disturbances	10 V/m 80 % AM (0.15 ... 80 MHz)		3	A
Emissions according to EN 61000-6-4 (2001)				
Test specification	**Limit values/IQPI**	**Frequency Range**	**Distance**	
EN 55011 (AC supply, conducted)	79 dB (µV)	150 kHz ... 500		
	73 dB (µV)	500 kHz ... 30		

EN 55011 (radiated)	40 dB (µV/m)	30 MHz ... 230	10 m
	47 dB (µV/m)	230 MHz ... 1	10 m
Emissions according to EN 61000-6-3 (2001)			
Test specification	**Limit values/IQPI**	**Frequency Range**	**Distance**
EN 55022 (AC supply, conducted)	66 ... 56 dB	150 kHz ... 500	
	56 dB (µV)	500 kHz ... 5	
	60 dB (µV)	5 MHz ... 30	
EN 55022 (DC supply/data, conducted)	40 ... 30 dB	150 kHz ... 500	
	30 dB (µA)	500 kHz ... 30	
EN 55022 (radiated)	30 dB (µV/m)	30 MHz ... 230	10 m
	37 dB (µV/m)	230 MHz ... 1	10 m

Attention
Install the device in a panel with no more than 55 °C.

3.2. Panel mount

3.2.1. Distance

System must be installed with a space for heat dissipation and cabling. Avoid cabling superimposing to avoid EMC problems.

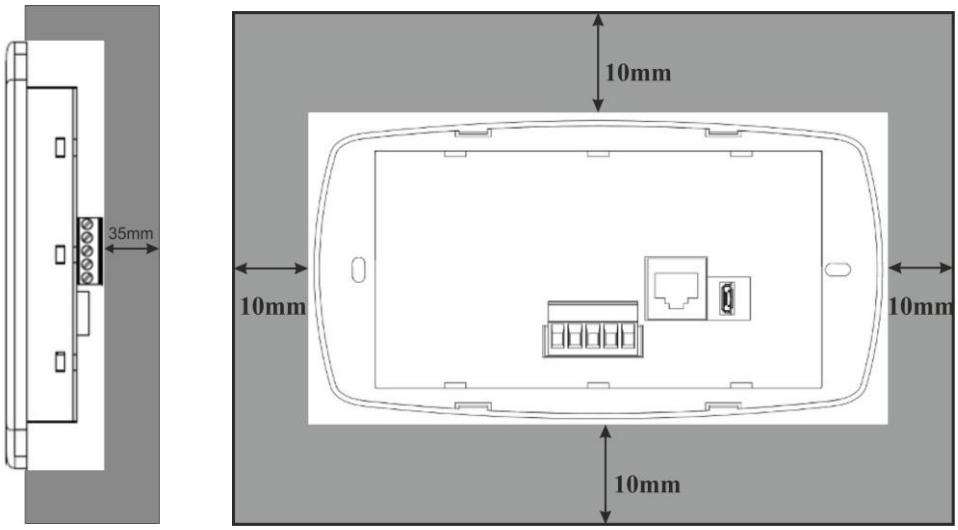

Figure 6A: Horizontal mounting

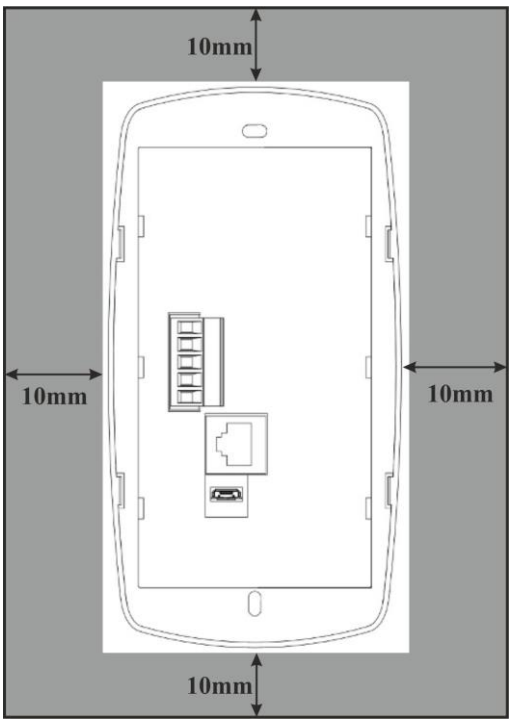

Figure 6B: Vertical mounting

4. TP1043 wiring

4.1. Connections

In the following figure see the wiring diagram.

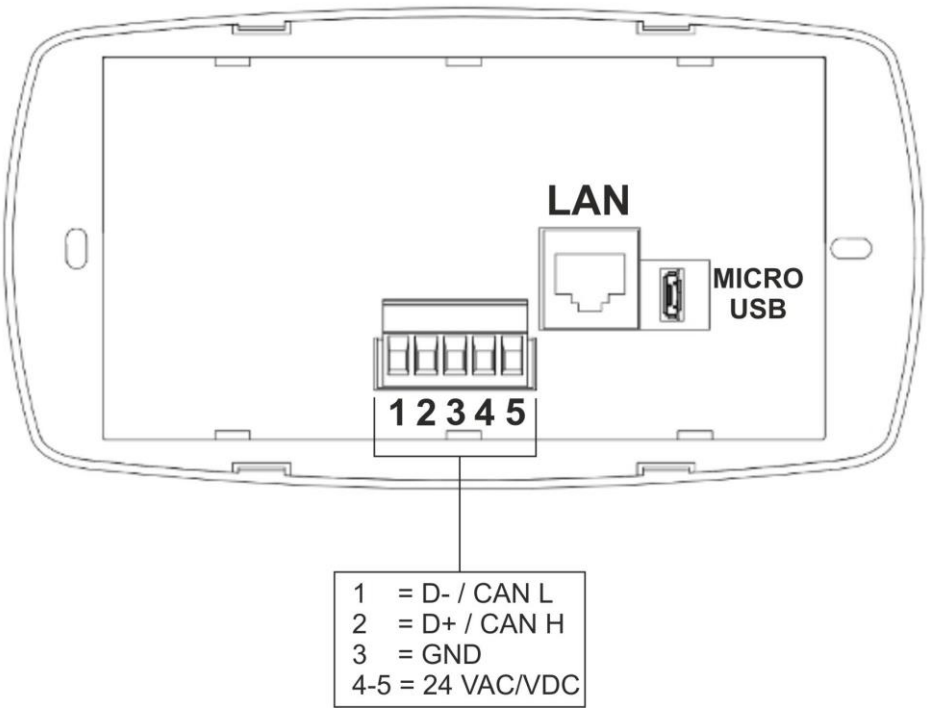

Figure 7

Table 3

TP1043	
Power Supply	24Vdc/Vac -10 /+20% 250mA (24Vdc)
Micro-USB	2.0
Ethernet	Bit rate: 100Mbit/sec
Serial ouputs	RS485 Modbus half duplex (hardware configuration) or CANopen

4.2. Power supply

4.2.1. Isolation

Device has no galvanic isolation between input, output and power supply.

4.2.2. System power supply

TP1043 has a 24Vdc/Vac (–10 /+20%) according to the scheme in the figure. System is protected against reverse power supply.

4.2.3. Fuse

System has no internal fuse , so is suggested the use of an external 500mA fuse for the panel power supply.

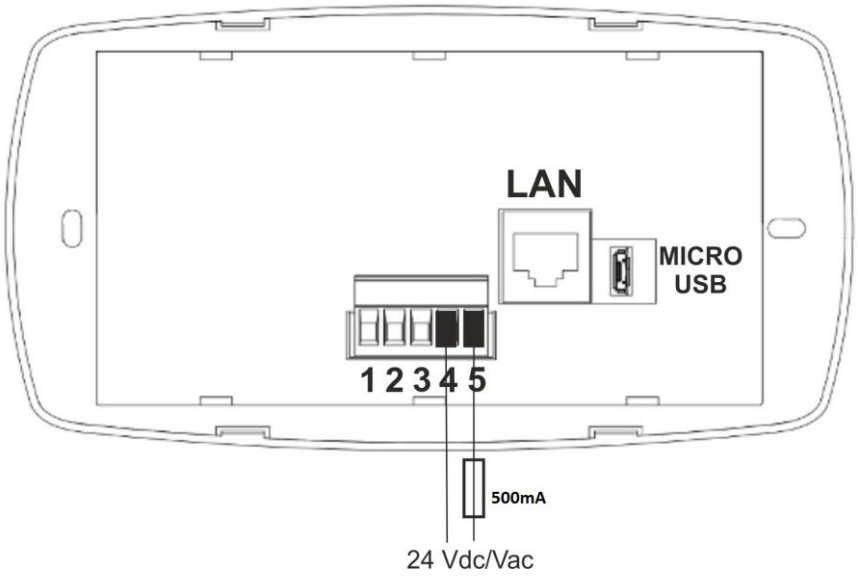

Figure 8

Attention
A wrong value for the power supply can cause a damage to the device

4.3. ModBus wiring

ModBus on TP1043 is a 2 wire RS485 serial line, on the terminal board on pins:

Table 4

Pin	Signal	Description
3	GND	
2	D +	Linea +
1	D -	Linea -

Example of a wiring of a system composed by:

- TPLC005
- MPNC020
- MPNC030
- TP1043

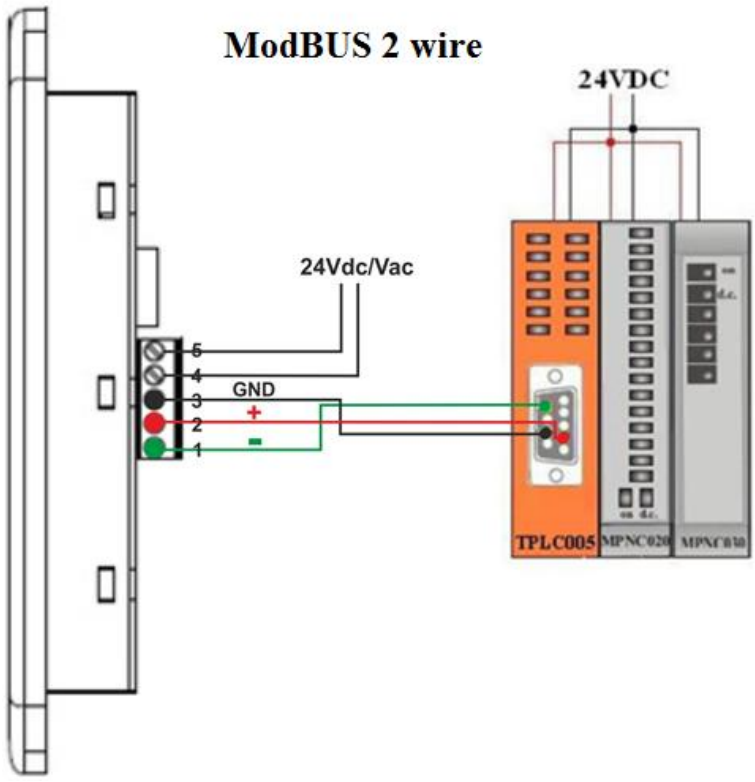

Figure 9

4.4. CANOpen wiring

The CANopen interface on TP1043 must be connected to the terminal block on the pins shown in the table.

Table 5

Pin	Signal	Description
3	GND	
2	CAN L	Linea -
1	CAN H	Linea +

Example of a wiring of a system composed by:

- MPNC010
- MPNC030
- TP1043

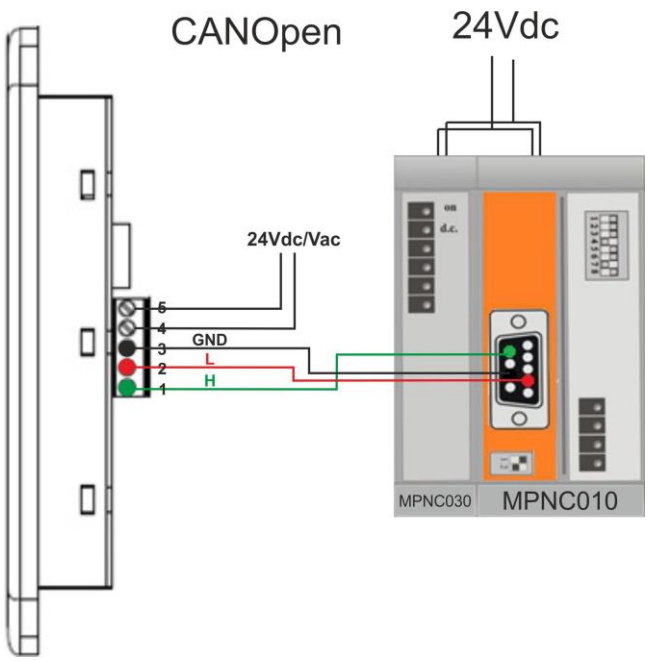

Figure 10

5. Peripherals

5.1. USB

TP1043 has a Micro-USB 2.0 host for:

- software update
- data storage: datalogger
- connect USB peripherals as printers, mouse, etc.

Specific connection of external peripherals are implemented on request.

5.2. Ethernet

TP1043 has a 10/100Mbit/s ethernet port with auto-configuration, moreover the connection cable between TP1043 and a personal computer can be either straight either cross.

6. HMI

To set the TP1043 is necessary to develop a software in QT Creator based on QT libraries, custom-tailored on MECT operator panel.
A specific tutorial is furnished with the device.
The QT Creator suite software is available in Windows environment.

6.1. System variables

The system can use 5472 interchange variables between HMI and automation (at maximum) which include:
internal variables, interchange variables on Modbus network, retentive variables.
The variables are defined by a tool furnished from Mect.

7. How to order